

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and the claims have been amended to provide broad coverage for the invention while continuing to distinguish over the prior art. Claims 1-20 remain pending in this application. Applicant respectfully requests reconsideration and allowance of the claims in light of the following remarks.

In the Official action dated May 10, 2005, the Examiner rejected claims 1-7 and 9-19 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,692,902 to Aeby in view of U.S. Patent No. 6,315,558 to Farzin-Nia et al. The Examiner sets forth that Aeby discloses many limitations of the claims but admits that Aeby fails to teach two opposite sides with one cutting edge each as required by claim 1. The Examiner states that Farzin-Nia et al. teach an alternative to three or four edge embodiments. Namely, the Examiner states that FIG. 2C discloses a two edge embodiment as an alternative to three or four edge embodiments. The Examiner further takes the position that it would have been obvious to one of ordinary skill in the art to modify Aeby to include a shaft having a cross sectional shape which has only two cutting edges, as allegedly shown by Frazin-Nia et al., in order to make use of known alternatives in the art. Applicant respectfully traverses this rejection for the following reasons.

Claim 1 recites:

A root canal instrument for manual use, comprising a grip member (1) which has attached thereto an elongated tapering shaft (2) which is provided with at least one cutting edge coiled in spiral form around the longitudinal axis (8) of said shaft (2), wherein said shaft (2) has a cross-sectional shape which is provided at two opposite sides with one cutting edge (3, 4) each and whose side surfaces (5, 6) connecting said cutting edges (3, 4) are each made convex. (emphasis added).

Providing a root canal instrument with a shaft having the cross-sectional shape set forth in the above-emphasized portions of claim 1 can be desirable for many reasons. For example, the referenced cross-sectional shape can provide more effective cleaning and inhibit damage to the root channel instrument by reducing the tendency of the instrument to clamp in the root channel in use. Moreover, when compared with instruments having three or more cutting edges, providing only two cutting edges at opposed sides of the cross section can reduce the costs of manufacturing the root canal instrument. Indeed, as set forth in the specification on page 5, lines 11-14, manufacturing costs can be reduced since only two side surfaces have to be machined in a corresponding way to obtain the desired cross-sectional shape.

In contrast, the Aeby patent follows a technical principle by which the root channel instrument is self-centering without a shaft having a cross-sectional shape “which is provided at two opposite sides with one cutting edge each and whose side surfaces connecting said cutting edges are each made convex” as required by claim 1. Indeed, the self-centering feature of the root channel instrument is achieved by providing three or four cutting edges that are always in contact with the root channel. The self-centering feature directs the instrument to follow the cross section of the root channel that can drastically vary along the length of the root channel. Clearing and cleaning the root channel with three or four cutting edges can be difficult since the self-centering contact between the root channel instrument and the tooth may cause damage to the instrument due to a clamping action between the instrument and the root channel. For instance, if the root channel instrument is inserted with too much force or inserted too deep, the self-centering cutting edges may cause the root channel instrument to become jammed or otherwise stuck in the root channel. Subsequent attempts to free the root channel instrument from the root channel may result in damage to the root channel instrument. Accordingly, application of such self-centering instruments

having three or more cutting edges may be limited to root channels having a circular cross section. Otherwise, cleaning or clearing of the root channel may not be effective and/or the root channel instrument may become damaged as described above.

In practice, root channels frequently include elliptical or other non-circular cross sections. In order to accommodate such non-circular root channels, the present invention contemplates providing a root canal instrument including a shaft having a cross-sectional shape which is provided at two opposite sides with one cutting edge each and whose side surfaces connecting said cutting edges are each made convex. This feature is not taught by the recited combination of references. Indeed, the Examiner admits that Aeby fails to teach two opposite sides with one cutting edge each as required by claim 1. Moreover, Farzin-Nia et al. does not teach or suggest “two opposite sides with one cutting edge each” and whose side surfaces connecting the cutting edges are each made convex as suggested by the Examiner. For example, FIGS. 2C and 3C of Farzin-Nia et al. each disclose embodiments having four cutting edges (103c, 107 respectively) as shown in the drawings and discussed in the specification (e.g., see column 4, lines 35-42). Indeed, the specification refers to the cutting edges 103 illustrated in FIGS. 2A-2C when stating “[t]ypically, files include three or four apices or helical cutting edges 103.” (Column 4, lines 40-41). Farzin-Nia et al. further discuss in great length the procedure used to create a rhomboidal transverse cross section (See column 4, lines 47-55). Therefore, Farzin-Nia et al. can only be regarded as teaching a rhomboidal transverse cross section presenting four cutting edges that can introduce the same disadvantages of ineffective cleaning and damage to the root channel instrument when used with non-circular root channels. Moreover, the manufacturing costs of producing the four cutting edge instrument may be relatively expensive due to the labor-intensive process of machining the four sides as set forth in column 4, lines 47-55 of the Farzin-Nia et al. patent. Applicant therefore respectfully requests withdrawal of the corresponding rejection of claim

1 since the proposed combination of Aeby and Farzin-Nia et al. fails to teach or suggest a root canal instrument having a shaft with a cross-sectional shape which is provided at "two opposite sides with one cutting edge each and whose side surfaces connecting the cutting edges are each made convex" as required by claim 1.

The Examiner further rejected claims 8 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Abey in view of Farzin-Nia et al. as applied to claims 1 and 2, and further in view of U.S. Patent No. 5,836,764 to Buchanan. The Examiner states that Aeby in view of Farzin-Nia et al. fails to disclose a non-cutting front portion as recited in claims 8 and 20. However, the Examiner states that Buchanan shows a non-cutting front portion 64, FIG. 4F, column 14, lines 58-62. The Examiner states that it would have been obvious to one of ordinary skill in the art to modify the Abey/Farzin-Nia combination to include a non-cutting tip as shown by Buchanan in order to prevent damage to the apical tissue. Applicant respectfully traverses this rejection. It is noted that the suggested combination of three references to arrive at the claimed invention necessarily involves improper hindsight reasoning and that claims 8 and 20 further distinguish over the prior art since the non-cutting tip of Buchanan is contrary to the teachings of Abey. Indeed, as set forth in FIG. 1 and column 2, lines 12-14, Abey specifically discloses a tip having a "conical point 1b" that is contrary to the non-cutting tip of Buchanan. Moreover, claims 8 and 20 depend from claim 1 which is believed to distinguish over the recited combination as previously discussed. Accordingly, for the reasons set forth above, Applicant respectfully requests withdrawal of the corresponding rejection of claims 8 and 20.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a

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telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. 35917.

Respectfully submitted,

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